The Northwestern MILLER
MILLING PRODUCTION SECTION

Relationship Between Bran Thickness and Milling Qualities of Some Pacific Northwest Wheats

M. A. Barmore, E. F. Seeborg, R. A. Larkin, M. M. MacMasters, M. J. Wolf and C. E. Rist

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EDITOR'S NOTE: The accompanying article, prepared for publication in this journal, is based upon a study reported in further detail in the July, 1951, issue of Cereal Chemistry. (Cereal Chemistry 28 (4): 247-258 (1951) "Studies on the Relation of Bran Thickness to Millability of Some Pacific Northwest Wheats," by R. A. Larkin, M. M. MacMasters, M. J. Wolf and C. E. Rist.

MILLING quality of wheat, especially the flour yield, has often been considered to be influenced by bran thickness (1, 2).* The work reported here shows that the bran thickness of seven varieties of wheat, ranging from excellent to poor in milling quality, is unrelated to the milling behavior of the wheat. These results corroborate the conclusions of Crewe and Jones (3), and Shellenberger and Morgenson (5) that bran thickness is unrelated to milling quality.

Cooperative studies now in progress at the Western Wheat Quality Laboratory, the Western Regional Research Laboratory, and the Northern Regional Research Laboratory, are designed to obtain basic information on the relationships between the chemical and structural composition of the wheat kernel and milling behavior. If such information can be developed and made available to breeders and millers, it will be possible for breeders to eliminate varieties with undesirable milling characteristics early in the breeding program, and for millers to benefit by the resulting eventual disappearance of such varieties from the market. Moreover, an understanding of the structural characteristics related to poor milling may provide the basis for a scientific approach to improvements in milling techniques. The Western Wheat Quality Laboratory has studied the milling behavior of many wheat varieties and analyzed the factors concerned in milling quality. These factors have been evaluated and a milling score established (4). This score is an attempt to express the relative milling values of wheat samples on the basis of five commercially important and variable factors: (a) rate of milling, (b) total flour yield, (c) milling moisture of wheat, (d) ash content of straight grade flour, and (e) percentage of first patent flour. These five factors are combined into a formula which can be applied to experimental milling data.

At the Western Regional Research Laboratory, analyses are being made in an endeavor to relate the chemical composition of the wheat kernel to milling characteristics (4). The Northern Regional Research Laboratory is investigating the microscopic structure and chemical relationships within the parts of the kernel to determine their significance with respect to milling behavior; this is part of the laboratory's broader program of investigation of chemical composition and microscopic structure of cereal grains as a basis for the development of new products and of new and improved processing methods.

In the cooperative studies on wheat, the three laboratories are simultaneously examining samples of the same lots of grain. The determination of the relationship between bran thickness and milling score constituted an early phase of these cooperative studies. Rex and Elgin varieties

(Continued on page 3a)

*Figures in parentheses refer to Literature Cited.

[1]Bureau of Plant Industry, Soils and Agricultural Engineering, in cooperation with the Chemistry Department, Washington Agricultural Experiment Station, the State College of Washington.

[2]One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U.S. Department of Agriculture. Report of a study made under the Research and Marketing Act of 1946.

Figure 1. Transection of Baart wheat showing the structure of the outer layers of the wheat kernel. (The outer pericarp was torn from the cross cells during the preparation of the section.) (a) Outer pericarp, (b) cross cells, (c) spermoderm, (d) nucellar layer, (e) aleurone, (f) starchy endosperm.

Figure 2. Longisection of Baart wheat showing the structure of the outer layers of the wheat kernel. (a) Outer pericarp, (b) cross cells, (c) spermoderm, (d) nucellar layer, (e) aleurone, (f) starchy endosperm. Magnification in Figures 1 and 2: 500 diameters.

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Figure 3. Surface view of cross cell layer stripped from wheat kernel. X100.

Thickness of Bran

(Continued from page 1a)

were chosen as representatives of poor and excellent wheat with regard to milling behavior.

Pacific Northwest millers are well aware of the difficulties encountered in producing flour from wheats of poor milling quality as exemplified by the variety Rex. Wheat of this variety, although having excellent agronomic characteristics and smut resistance, reduces the rate of milling and affects the efficiency of the separation of the endosperm from the bran and embryo. In common with other soft white wheats of poor milling quality, the partially ground endosperm of Rex yields so-called "fuzzy" stocks. Such materials are hard to classify, with resultant overloading of the sifters and reduction of the milling rate. Flour yield, ash content of flour, and tempering moisture are also considered in evaluating milling quality. Data from experimental milling of Rex and Elgin varieties are given in Table 1.

In contrast to Rex, the variety Elgin is recognized by millers as a wheat with good milling qualities. It produces relatively large amounts of straight grade flour of low ash content and mills much more rapidly than Rex. On the basis of calculations made at the Western Wheat Quality Laboratory from experimental milling runs, it has been estimated that operating costs may be increased as much as $600 per day for a mill handling 400 bu. an hour when Rex wheat is milled, in comparison with a good milling variety such as Elgin.

Rex, Elgin and five other varieties intermediate in milling quality were chosen for the measurement of the total thickness of the bran coat and also of the individual layers of which it is composed. The relative thickness and order of arrangement of the five layers within the bran are shown in cross and longitudinal sections, respectively, in Figures 1 and 2. Millers may be more familiar with the surface view of these layers. Three layers are shown in surface view in Figures 3 and 4. In some bran layers, the cell walls contain conspicuous pits. An example is shown in Figure 5.

Table 1—Experimental Milling Results

Variety—	Milling moist., %	Milling time (min.)	Flour, %	Bran, %	Shorts, %	Remarks
Elgin	16	21	75.4	19.4	5.2	Good
Rex	13	25	69.0	22.0	9.0	Poor

Table 2—Comparison of Data on Milling Characteristics and Bran Thickness for Seven Pacific Northwest Wheats Covering a Wide Range of Milling Behavior

Variety—	Total milling score	Straight flour yield %	Total bran thickness microns	Thickness of bran layers (microns): Outer pericarp	Cross and tube cell layer	Spermoderm	Nucellar layer	Aleurone layer
Elgin	85.4	76.8	105.8	31.5	14.8	2.0	11.5	46.0
Hymar	81.7	74.2	99.7	24.7	13.8	2.4	11.0	47.8
Triplet	83.7	72.8	119.6	30.3	18.2	2.5	13.9	54.7
Marfed	79.5	73.2	106.3	24.3	17.9	2.1	10.4	51.6
Baart	77.0	69.0	119.0	29.0	20.5	2.5	13.0	54.0
Brevor	75.0	69.8	102.2	29.3	14.4	2.1	11.1	45.3
Rex	69.0	67.1	105.4	26.4	15.8	2.0	9.8	51.4

Total thickness of the bran varied considerably among the varieties, but did not appear to be related to either flour yield or the milling score of the varieties (Table 2). The milling qualities of Elgin were excellent, Marfed good and Rex poor. Yet there was little difference in the thickness of their bran. Triplet and Baart, good milling varieties, had thick bran. Hymar and Brevor which had exsellent and poor milling qualities, respectively, both had thin bran.

Bran Thickness Variable

Thickness of the individual bran layers varied considerably among the varieties, but did not appear to be the major factor governing milling quality. The layers also varied in thickness at different places on the kernel. The outer layer of the bran, i.e., outer pericarp, was thickest at the brush end and was about uniform in thickness along the sides and near the germ. The outer pericarp was approximately of uniform thickness from the crease and cheeks around the kernel. The cross and tube cell layer was uniform in thickness from the brush to the germ, but on the dorsal side it was thicker than over the cheeks. The seed coat, a thin structure varying from 1.5 to 3.5 microns in thickness, was thickest at the brush end and gradually became thinner toward the germ. In the cheeks, the seed coat was thicker than on the dorsal side. The nucellar layer was thicker toward the brush and on the dorsal side than over the rest of the kernel.

Work is being continued to determine the microscopic structural and chemical relationships within the bran and endosperm of the seven wheat varieties used in this study. Difference in milling behavior exhibited by wheat varieties may be influenced by both structure and composition of the kernels.

The establishment of microscopic differences indicative of milling qual-

Figure 4. Portions of three bran layers stripped from wheat kernel. The dark, thick-walled cells are cross cells. The thin-walled cells, parallel to the cross cells, form the seed coat. The wider, thin-walled cells, at right angles to the cross cells, compose the nucellar layer. X100.

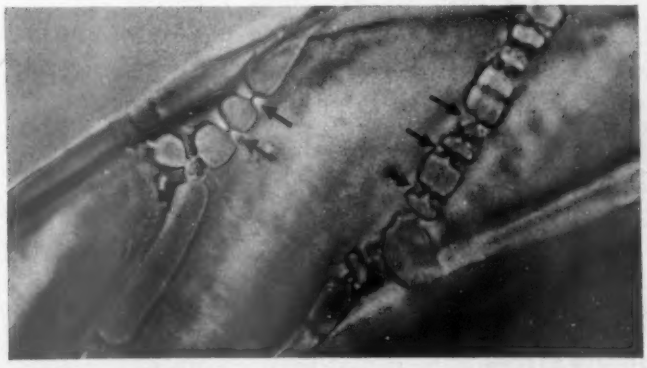

Figure 5. Portion of tangential section of the outermost layer of wheat bran, showing the pits (indicated by arrows) in the cell walls of the subepidermal layer. X1000.

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ity would not only provide a basis for selection of new varieties but would also furnish a scientific foundation for the understanding and improvement of the milling process.

Acknowledgment

The authors are indebted to members of the Western Regional Research Laboratory for their excellent cooperation and to the following workers at the Northern Regional Research Laboratory: Constance L. Buzan for assistance in the laboratory work, and J. J. Curtis, Irene M. Cull, Helen Bowker and Marjorie J. Austin for aid in handling the data for statistical analysis.

LITERATURE CITED

1. Anonymous—"Further Details of Earlier Wheat Character in Chemists Report No. 2"; Northwestern Miller, 243 (1):12-13 (1950).
2. Anonymous—"Southwest Creal Chemists Crop Reporting Committee"; Baker's Helper, 94 (1173):60, 99 (1950).
3. Crewe, J., and Jones, C. R.—"The Thickness of Wheat Bran"; Cereal Chemistry, 28 (1):40-49 (1950).
4. Mecham, D. K., Seeborg, E. F. and Barmore, M. A.—"The Influence of Crude Fat Content on Wheat Milling Characteristics"; Cereal Chemistry (In Press).
5. Shellenberger, J. A., and Morgenson, J.B.—"Bran Thickness and Flour Yield of Four Varieties of Wheat"; American Miller and Processor, 78:29, 30, 36 (1950).

Centrifugal Clutches

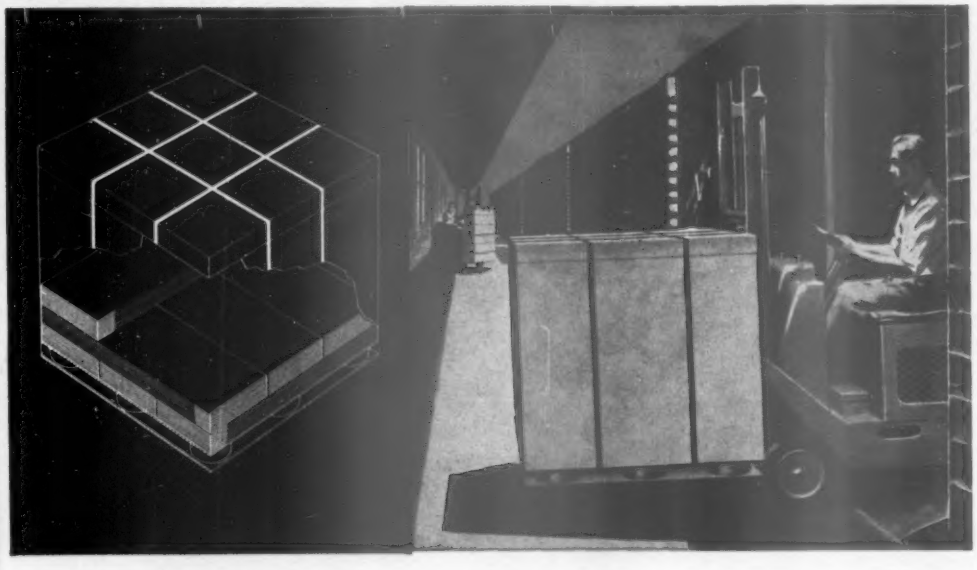
There are many cases in which it is desirable to provide for automatic and relatively-gradual pickup of a load. In countless cases of this kind, some type of clutch making practical use of centrifugal force is employed. Where centrifugal force is thus used in a clutch to cause elements to be urged outwardly from the center of rotation, it naturally follows that the driving member must pick up considerable speed before this initial actuation begins to occur.

This centrifugal urging of outward movement is then employed either directly or indirectly, in practically all cases, to provide necessary frictional pressure for powerful clutch action. It is readily seen that it is only as the driving member reaches its full speed that the greatest build-up in centrifugal force can occur, and consequently the greatest frictional pressure in the clutch. Thus, the load is picked up gradually and progressively, with much less shock. It is always picked up at an accelerated rate, however, due to the fact that centrifugal force varies not as the speed, but as the square of the speed.

One very interesting type of centrifugal is composed of two drum-type members, the driving member rotating within the driven. The driving member has recesses in its periphery, designed to receive and hold six floating segments or shoes. These segment-type shoes are made up of lead with friction brake lining attached, the total weight of the shoes in each case being calculated to provide the correct pressure under the amount of centrifugal force available to carry the load. At very low speed, these segment-type shoes exert no outward pressure worth mentioning, but as the speed of the driving member increases, the frictional pressure increases, because the shoes are thrown out against the inner surface of the outer drum periphery with increasing force. As a result, the outer drum or driven member begins to revolve, and increases in velocity until the driven member is fully up to speed.

Shoe-Type Centrifugal Clutches

An interesting aspect of this type of centrifugal clutch is the fact that shoes of the type described may be restrained from easy outward movement in any desired case, by fitting them with tension springs. These springs will prevent outward movement of the shoes until speed in the driving member builds up to some predetermined point. Obviously, by manipulating the strength of spring-restraining action, the point in rotary speed at which the shoes will begin to engage under the urgence of centrifugal force can be pre-selected. Such a spring-restraining arrangement has been found highly advantageous in the case of engine drives, where spring-controlled shoes allow the engine to idle at any predetermined speed, (though clutch-connected to the load) and then to automatically pick up their load as the speed of the engine increased for the purpose. The springs used in this particular clutch are of leaf type.—**Mill and Factory.**



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KANSAS CITY—James F. Sims has been appointed superintendent of Moore & Daniels, Inc., Kansas City, steel fabricator and mill and elevator builder. Mr. Sims until recently was associated for many years with the Midland Flour Milling Co., Kansas City, and is well known to millers in the Southwest. He began his milling connections with the Great Western Mfg. Co., Leavenworth, Kansas, and subsequently was associated with the Standard Milling Co. in Kansas City.

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Mill Machinery and Replacement Parts

How to Get Them Under Government Controls

• By Raymond J. Walter •

EDITOR'S NOTE: The author of the accompanying article is executive secretary of the Grain Processing Machinery Manufacturers Assn. In this article Mr. Walter outlines materials control problems and developments affecting the milling and other grain processing industries. It is adapted from the text of an address made at the recent convention of the Eastern Federation of Feed Merchants.

HOW would you like to have a nice tank-steak, with a side order of fried cannon? If cattle were fed finely processed battleship, what kind of meat, milk and butter could you have? Would chickens produce better chickens and better eggs if fed jet planes?

No. "It does not fly, it does not float, it does not shoot," but food is essential.

Man must operate the instruments of defense. Man must personnel the plants to build those instruments. And the morale, strength and will of those in the armed forces and the civilian population in back of them can only be maintained if they are properly fed.

We have the "know how" to scientifically produce the best, the most productive, feed, flour, cereal and seed in the world. And we do it in a larger volume, at less cost and with less waste in manpower and materials because we do have that "know how."

Conservatively speaking, 70% of the food produced and consumed in this country is directly accountable to the grain and seed processing industry.

The first order of the Defense Production Administration, among other things, designated as claimant the Secretary of Agriculture with respect to food processing and distribution.

Remind Congressmen

Secretary Brannan of the Department of Agriculture has rolled up his sleeves and gone to work in a sincere effort to provide an adequate food supply. He cannot be expected to do the job alone. Our senators and congressmen who are entrusted with the responsibilities of representing us in Washington should be urging the doing of everything to protect the nation's supply of food.

It is only natural, that so long as people and cattle and poultry are being fed, tomorrow's situation may be overlooked. I have heard it said "don't cry until you are hurt." I have, also, heard that "an ounce of prevention is worth a pound of cure."

It takes time to manufacture food processing machinery. We cannot afford to wait until the feed processor or the seed processor or the miller breaks down for want of the necessary machinery and equipment. If we wait to cry then, it will be months before the materials can be secured and the machinery manufactured and delivered. Meanwhile, what has happened to the processor? What has happened to the manufacturing of this vital machinery? Can we afford to risk it?

Trade Association Formed

The far-seeing machinery manufacturers engaged in this industry recognized the need of a national trade association to present a potent force in the best interest of the nation and of the industry.

In March of this year, the Grain Processing Machinery Manufacturers Assn. was formally organized. Today, it is composed of most of the prominent manufacturers engaged in the industry.

The association immediately began compiling the facts as to what materials were needed to effectively carry on this industry. These were submitted to the Department of Agriculture and to the National Production Authority.

In response to the association's request, the NPA constituted an advisory committee for this industry. Industry advisory committees are representative groups formed for the purpose of furnishing advice and information to NPA on matters in furthering the defense effort. It is our industry's voice to government on what the conditions are in the industry and what is needed to do its job in assuring the nation of its essential food supply.

This NPA advisory committee held its first meeting with officials of NPA, DPA and USDA in Washington May 23. We have secured a copy of the minutes of this meeting which have now been made a matter of government record.

You should know what the manufacturers are advising the government in an effort to assure adequate machinery and replacement parts.

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from the official minutes. It was pointed out:

"Although the grain processing machinery industry is made up of small companies, those companies have diversified requirements of hard-to-get components and materials for which many are desperate today because the industry has no priority. These small companies, most of them employing no more than 327 men, must compete with more powerful buying groups, such as automobile manufacturers, for scarce materials.

"Several members said that orders placed by their companies six months in advance had been set back indefinitely because DO-rated orders had taken the complete production of the supplier, some of which had been originally scheduled for grain processing machinery manufacturers. The committee members felt that those orders could be reinstated for their original delivery date if the industry were given a priority rating. Leading manufacturers of materials needed for grain processing machinery have stated that deliveries requiring 46 to 52 weeks could be made in 22 to 24 weeks if the industry had a priority rating.

"An industry representative told of a survey made in March among trade association members to ascertain how long they could continue their present level of operation on the basis of their existing stocks of critical materials, particularly steel, allowing for commitments received from sources of supply for additional materials. The report indicated that within three months the industry would be operating at a level of 48.3% of normal production, in four months at 34.1%, in five months at 27%, and in six months at 22%. It is not possible for this industry to operate at less than 50%.

"The Department of Agriculture has announced that acreage will be increased from 10 to 20% on various grain commodities. If acreage is increased, an industry representative said, facilities to process the commodity item will have to be expanded to keep in balance with the food program.

"He urged that consideration be given to providing priority assistance to the grain processing machinery industry, such as that provided the farm implement manufacturers under M-55, to procure components and materials. The amount of materials needed by this industry is comparatively small, but without some assistance in procurement, the manufacturers cannot maintain the level of production needed to complete a necessary phase of the food program.

"NPA has issued Order M-55, which provides sufficient steel for the production of farm implements needed for planting, seeding and harvesting grain. Before this grain can be used as a food commodity, the industry representative pointed out, it must be cleaned, graded, ground, mixed, pelleted and prepared in various forms such as flour and cereals. Some of the processed grain is returned to the farm as food for livestock from which such basic commodities as milk, meat, butter and eggs are derived."

Controlled Materials Plan

Now, what was said in the committee about the Controlled Materials Plan? I quote:

"James Creed (general industrial equipment division, NPA) reminded the committee members that 4B applications for controlled materials to manufacture 'D' products should be filed before May 31. Manufacturers of 'B' products are asked to estimate requirements for the third and fourth quarter of 1951 and the first and second quarters of 1952. These requirements will be screened by industrial specialists, and the requirements committee will determine allotments. It is hoped that approved allocation numbers for controlled materials and DO ratings for other materials can be given to manufacturers by the third week in June so that orders can be placed for the third quarter.

"In answer to a question, Mr. Creed said that the DO-rating will be used to obtain component parts. All materials obtained with a DO-rating will match the amount of allotted steel; however, the only limitation on the volume of purchases a manufacturer can make on component parts is that imposed by Regulation 2.

"In cases where a manufacturer is jobbing rather than manufacturing components for maintenance, repair and operation, he should file a separate CMP application for MRO. Estimated requirements should be based on previous periods, and the manufacturer will receive an allotment to cover these requirements. The same product code number is used in filing for MRO, Mr. Creed said.

"He explained that a manufacturer should extend his allotment number and rating to orders already placed as soon as possible. In a case where a manufacturer has placed an order to be delivered in six months, he can apply his allotment number. Industries under CMP will be allowed to use 60% of their CMP allotment in the fourth quarter, 40% in the first quarter of 1952, and 40% in the sec-

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ond quarter of 1952 in placing orders in advance, he said.

"In manufacturing new products with no history, a company must send an explanation to NPA with its request for an allotment. All hardship cases may be appealed in Washington for the third quarter. After that time, small business appeals will probably be transferred to field offices, Roy C. Hartwell, government presiding officer, NPA, stated.

"In summing up it was stated that the grain processing machinery industry made a valuable contribution to the food program during World War II and is ready to perform the same function at this time.

"It was recommended that the industry be given priority assistance on critical materials needed to maintain production of essential food processing equipment."

May I recall to your attention the observation I made regarding the issuance of NPA of the M-55 order and the M-55 amended order on farm equipment.

I have reported to you some of the highlights of the grain processing machinery industry advisory committee meeting.

Inasmuch as what I have quoted is from the official record, the information should prove more valuable than any discussion of mine. However, I believe a few further words on the Controlled Materials Plan might be worthwhile.

Two Main Differences

Briefly, it is the same plan as developed in World War II with two principal differences, which are differences in timing and not of the plan itself. These differences are "open ending," which I believe will be found impractical, and decentralization.

In the first instance it was planned to allot only the steel, copper and aluminum for those products which are definitely connected with defense supporting problems. What would be left over would be allotted to other industries.

We need not be alarmed about this as food processing has been listed in the defense supporting category, and due to the activity of the Grain Processing Machinery Manufacturers Assn., all products necessary for the carrying on of our industry are being included in the revised CMP listing.

In the second instance or difference, it was planned that after the first go-round of CMP, allotment applications will go direct to the NPA field offices and get not an allotment for one quarter, but for the full year.

Promptly after the enactment of CMP, four regulations were issued.

Reg. 1 defines "rights and obligations under the Controlled Materials Plan" and explains how production schedules will be authorized for defense and defense-supporting manufacturing operations and how controlled materials (steel, copper and aluminum) will be allotted for completion of authorized production.

Four schedules are attached to CMP Regulation 1. Schedule I names the forms and shapes of steel, copper and aluminum which make up the list of controlled materials. Schedule II reproduces a short form of allotment which may be used in making an allotment to a sub-contractor for manufacture of an A product. Schedule III lists items of controlled material, the number of days a delivery order must be placed in advance of the first day of the month in which shipment is required. Schedule IV lists the minimum mill quantities for which a controlled materials producer must accept orders.

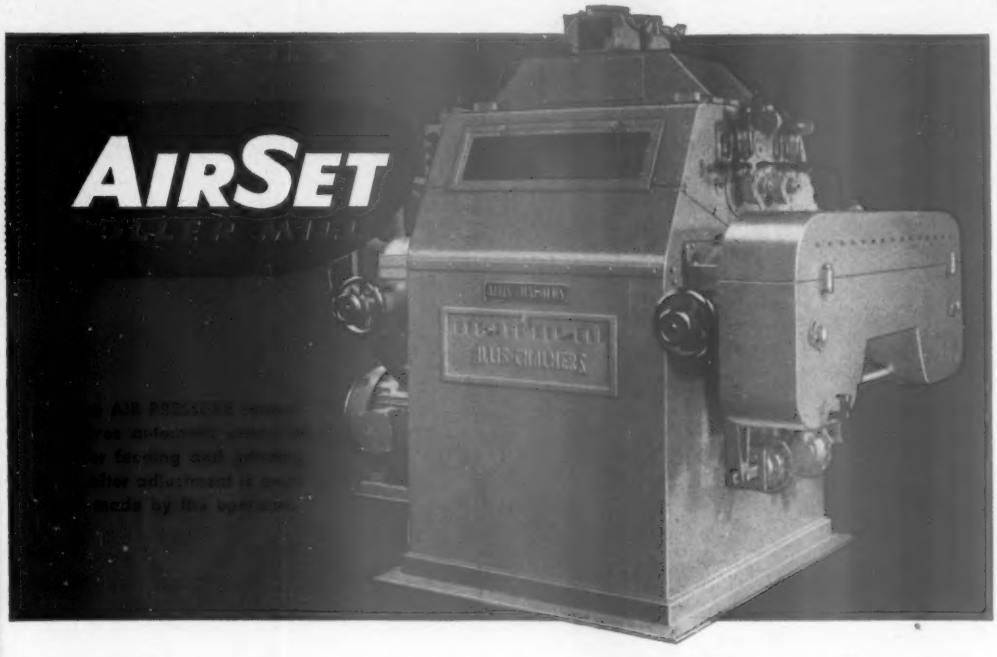
Reg. 2 sets limits on the amounts of controlled materials that a user may have in inventory.

Reg. 3 establishes the relative preference status of delivery orders for controlled and other materials needed for production of goods deemed essential to the rearmament program and the general economy.

Reg. 4 establishes rules for deliveries of steel, copper and aluminum by warehouses, jobbers, dealers and retailers.

Manufacturers in this industry who use only small quantities of steel, copper and aluminum are provided with a simple method of securing these basic metals by NPA Directive I to Reg. 1. NPA has also issued Directive II to Reg. 1 which provides a "DO" for other materials. Time does not permit discussing these orders which were issued by NPA June 8. They can be secured at U.S. Department of Commerce field offices.

Copies of the following publications can be obtained without charge from



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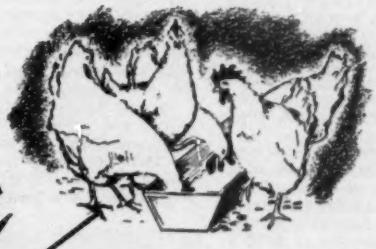

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NPA or from the field offices of the Department of Commerce.

1. A booklet entitled "ABC's of CMP," intended for readers having a general interest in CMP as well as for manufacturers and others who will be directly affected by its operation. For the latter group, detailed information is also available in the form of regulations, application forms and instruction sheets.

2. A pamphlet entitled "Inventory Control and Priorities."

3. A "Mobilization Guide for Small Business."

Also published is the "Defense Production Record." This is released each week and provides a concise explanatory record of all official actions of DPA and related federal agencies. There is a charge for this of $2.50 a year ($4 to foreign addresses). Subscriptions should be sent to the Superintendent of Documents, Washington 25, D.C.

How do we get machinery and replacement parts under government controls? I have tried to present some fundamental facts. I have advised you what the machinery manufacturers are doing about it. I have told you a little about CMP and how to get further information. We know our industry is essential. We know that NPA should see to it that the materials needed to assure an adequate food supply are promptly allocated.

We must have steel, aluminum and copper. Now here are a few words about steel. According to Charles R. Hook, chairman of the board of Amco Steel Corp., in 1950 we turned out 97 million tons of ingots in the U.S. And of that 97 million tons, how much is needed for this essential industry? One million? No. One half million? No. One tenth of a million? No. Only approximately 65,000 tons. And food is essential!

Also, we know that the production of steel will be greater this year. However, scrap is important in the production of steel and the flow of iron and steel scrap to mills and foundries is not keeping pace with consumption. This matter of conservation was seriously considered by the industry's NPA advisory committee.

Scrap Drive

Manly Fleischmann, NPA administrator, has appealed for help. The Grain Processing Machinery Manufacturers Assn. is "spearheading" a scrap drive program. Let us have our entire industry get behind this.

1. Search all plants and properties, regardless of size, for dormant scrap such as obsolete machinery, tools, jigs, dies, fixtures and other equipment, including items that are broken, worn beyond repair, abandoned or in need of parts that can no longer be obtained.

2. Survey potential wrecking and dismantling projects that will produce scrap.

3. Make disposition of all production and dormant scrap as quickly as possible. Dormant scrap, presently useless, can, by its being turned in, help your industry secure its material requirements.

All are urged to actively cooperate in this scrap drive now.

Frankly, the processing machinery manufacturer is having material difficulties now. Our association has been doing what it can to see that the manufacturer gets his materials, so that the user can get his machinery, so that adequate food can be processed. Our industry should be making energetic cooperative efforts on this.

Official Washington can very easily say, "The food industry is all right. Didn't we grant a priority to the farm equipment people?" Sure they did. But what good is the hub of the wheel without the spokes and the rim? The job is only partly done.

Priority orders should be issued to assure the necessary materials for the manufacture and maintenance of all food processing machinery, not just one segment of it which is useless without the others.

Unless this is brought emphatically to the attention of official Washington, it is natural for them to assume everything is all right with the nation's food supply, it has no worries or problems. We know we do. We know we are worried. We know we are now faced with material difficulties, that unless promptly rectified, the nation's food supply is imperiled. Tell your senator and congressman about this and urgently request that they bring this to the attention of the DPA and NPA administrators and to the Secretary of Agriculture. Food is essential, and food processing machinery should be given definite and adequate material priorities.

The nation's food supply is vitally important. It is your duty as an American to take action to assure an adequate production of food. I appeal to you to be energetically vigilant.

—BREAD IS THE STAFF OF LIFE—

SURPLUS VS. SHORTAGE

An interesting point in the boxcar situation is that both "surplus" and "shortage" of boxcars may exist at the same time, because of the inability to have perfect geographical distribution of cars at a given time. All empty cars are not "surplus." In fact, there are a number of seasonal movements of agricultural products which could not be handled satisfactorily without advance preparations.

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A British Viewpoint *From "Milling"*

Importance of the Break System in Milling

WHEN extraction is low or flour quality poor, it is of equal importance to check the stocks leaving the break system as it is to check the rejected offal after being processed. In other words, the performance of the graders, dusters, purifiers, reduction and dressers is largely dependent on the quality of work accomplished in the breaking down section.

Prevention is better than cure, and although purifiers are instrumental in our attempt to correct the failings of our break system, not forgetting the partial purification obtained in reduction rolling and dressing, it follows the better the stock quality leaving the breaks the better chance we have of making a high quality flour.

The general principles of good milling practice apply with equal force today. The main object behind the operation of a roller milling plant is still to make as clean a separation as possible between the endosperm and the bran, while obtaining the required release of flour.

It cannot be too strongly stressed that this separation has to be mainly made in the break system.

Higher Break Releases—Effect on Quality of Release

I think it has become almost general practice to increase the first and second break release considerably above prewar conditions. The actual releases taken will vary from mill to mill, and will be determined to some extent by the grist being used, the moisture content, roll surface available, etc.

What has not become general practice, however, is the adjustment of break roll fluting, spiral, angle of flute, etc., to suit the higher releases being taken.

Most of you will appreciate that a first break release of 50% will result in a vastly different balance of separation than obtained from a 30% release. Sieving tests show that with the heavier release, a much higher proportion of flour, middlings and scratch material makes up the balance of the total release. Now the production of break flour is undesirable. Middlings are not easy to dust and purify and the production of excessive quantities of scratch material means that we are falling down in our main objective, that is in releasing the endosperm with as little cutting of the bran as possible.

And so attention should be given to the arrangement of the break fluting, spiral, etc., and the use made of the combination that will indicate from sieving tests the best possible release separation regarding quality.

This arrangement of break roll fluting, spiral, etc., will indeed affect the feed to the subsequent breaks as well as the actual releases taken at any one break stage. However carefully any later break roll is set up and however evenly the feed is spread, the poorer the uniformity of particles in any given feed, the poorer the resultant release.

This point, first of all, emphasizes the benefits derived from a grading of the break roll feeds. But even after grading these stocks into coarse and fine, the actual classification of each can be markedly improved by careful arrangement of fluting conditions.

Conditions Prevailing on Lower Break Rolls

On the later breaks, these principles take on even greater importance. After the relatively high percentage of endosperm released on the first and second breaks, it follows that work done on the third, fourth and fifth break stages must be very carefully adjusted if the requisite quality of release is to be taken without cutting excessive quantities of offal into the grading and purification system.

Again the importance of graded feeds to the break stages is emphasized. The finer particles take on a more chunky form and it is quite impossible to do justice to the broader bran flake which on the fourth and fifth break exists at only a few thousandths of an inch in thickness if mixed with the smaller and thicker fine particles.

Here I must qualify my remarks by saying that consideration must be given to each individual flow as so much will depend on the number of stages available and their comprehensive nature. However, where we have the facilities as exist today in all but the very small plant, of separate dusting, grading and purification of third and fourth break stocks, I do think in many cases these third and fourth break passages are prevented from performing efficient work through being too lightly fed.

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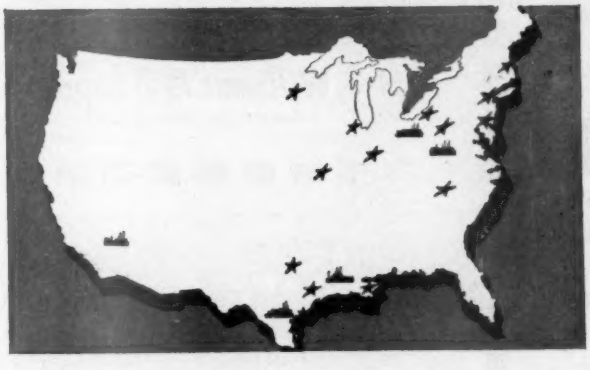

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release being taken from the first and second breaks, leaving only 6 to 8% duty for the remaining two or three breaks, and very often these remaining breaks constitute 40% of the total break roll surface.

Effective Recovery from the Third Break System

Where third break purification is employed, these will invariably feed the head reductions, and if a fair balance of feed is allowed to the third break rolls the stocks feeding the head reduction can be of reasonably good quality. Therefore, there should be no question of loss in extraction through distributing the total release more uniformly over the first three breaks.

Bran Finishers

I suppose most of you have come into contact by this time with some form of bran finisher. Their usefulness has certainly been appreciated since the advent of high extraction milling. Now that we are called upon to recover such a high percentage of the endosperm from the bran, the mechanical perfection of roller mills is such that it is extremely difficult to effectively scrape bran flakes of a few thousandths of an inch thickness without actually shredding the bran and creating excessive powder. The principle of the bran finisher is such that the last traces of endosperm are scoured off without undue damage to the bran itself. To my mind, these machines perform a very useful purpose in high extraction milling and, providing the later break rolls are used intelligently, they can recover up to .5% flour, which is usually of better color and quality than the last few reduction flours.

We have already mentioned the fact that with higher break releases, an increase in the proportion of scratch material will result. We endeavor by means of roll fluting arrangement to reduce this as far as possible and to obtain a total release of as high a quality as possible.

In spite of these adjustments, when obtaining a higher total break release the quantity of scratch material will also be higher than when milling under lower extraction and the quality of the scratch stocks will take on a wider range of imperfection.

Importance of a Well Classified Scratch Stock

In order to cope with this increase, many mills have extended the scratch system considerably. There is certainly the need for this extension, but my own experience has been that even after extension sufficient attention has not been given to maintaining a close grading of scratch stocks to each of the scratch passages.

Too much of the finer break roll stocks are often taken via the purifiers into the scratch system. When this happens, purifiers are unnecessarily overloaded and prevented from doing maximum work on the good stocks present. Some of the finer and poorer scratch stocks my pass through the covers feeding the reduction system while the remainder will occupy valuable surface in the scratch system proper.

Those particles finding entry into the reduction system will "cushion" the better quality stocks preventing efficient grinding, and may well cause undue bran powder and discoloration of the resultant flour, while the coarser and poorer quality scratch material can contaminate the finer scratch releases through the closer work normally done on a scratch roll as compared with a break roll setting.

In order to maintain the feeds to the scratch stages of relatively high quality (and this is of importance since most scratch systems recover stocks for the head of the reduction system), a careful study of break scalpers is necessary.

By careful study of the clothing of these scalpers, it is possible to retain the coarser and often less pure scratch material in the break system, by tailing them together with the fine break feeds. Here they are adequately dealt with while the necessary extra roll surface accommodating them is available through higher releases on the earlier breaks.

By these means a maximum quantity of offal is retained throughout the break system until finally rejected to offal via the last break scalper.

In this way any scratch system maintains its primary function, i.e., that of recovering good quality semolina and middlings for return to the head of the reduction system and "A" roll feed can be maintained at high quality level, knowing that by sending the slightly inferior "A" stock to scratch it will be recovered uncontaminated by an inferior scratch classification.

In this section there has not been a great deal of alteration, that is, apart from cover adjustment to meet the new balance of the various stocks. In the dusting section, it is important to check degree of severity of individual machines. The lower moisture content at which we are now milling tends to give freer dressing of all stocks. It may be possible, as was the case with the flow sheet under review, to dispense with some of the prewar dusting surface. In this case, it was found that the fine semolina passing through the covers of the coarse semolina grader was perfectly free and clean and in suitable condition for purification.

When passed to the fine semolina duster, an appreciable quantity of

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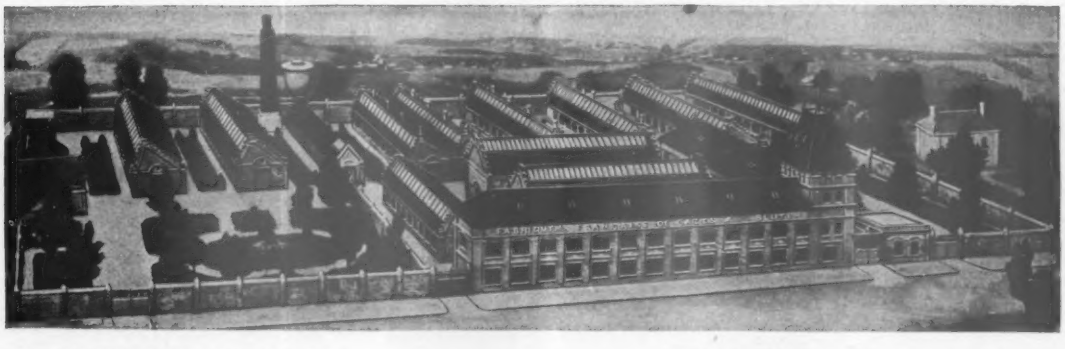

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flour was obtained. This flour was of poor color and quality and was, of course, purely attrition flour resulting from the action of beaters in the duster.

Purification—Its Important Objective

The purification section stands as a policeman—a last line of defense in our attempt to prevent the entry of offal into the reduction system. It can indeed perform a wonderful duty, rejecting a constant stream of fibrous material to the offal sack; alternatively, if neglected it can become the distributing center for contamination.

An important aspect in relation to this system is to obtain as near as possible the correct allocation of available surface to suit the new proportion of coarse and fine stocks.

It is also desirable to provide purification passages for any extra scratch stages introduced and to give wherever possible ample purification to the lower break stocks which will be higher in quantity and poorer in quality.

In this approach to additional purifier stages, it may be considered beneficial to repurpose any existing repurification sieves and in some cases to combine stocks of like quality for combined treatment.

Fourth and fifth break middlings benefit considerably from purification, large quantities of relatively pure offal can be separated and thus prevented from entering the reduction system. It is thus highly important to provide purification for these stocks wherever possible.

First tailings also benefit considerably from purification as apart from the removal of offal contamination; it also enables a much closer classification to be maintained between coarse and fine grouping within the reduction system.

Purification is undoubtedly more essential to the milling of high extraction flours than when milling at short extraction.

—BREAD IS THE STAFF OF LIFE—

Installation, Maintenance of Gearmotors

Considerable time frequently elapses from the time the gearmotor is shipped from the manufacturer until it is placed in operation by the customer. So it is important that the crating of a gearmotor be examined as soon as it is received for evidence of damage due to rough handling.

The gearmotor is shipped bolted to skids that form the bottom section of the shipping crate. When the top and sides of the crate are removed, leave the gearmotor bolted to the skids for ease of moving until it is to be mounted on its foundation. When removed from the skids or lifted to its place on a foundation, the gearmotor should be lifted by a sling.

Unit should not be lifted by the eyebolt in the motor frame. This eyebolt has been designed to support only the weight of the motor and the adapter plate and is furnished to simplify the job of removing the motor from the gear portion of the unit.

When the unit must be stored for any length of time before installation, the storage location should be dry and clean, and the temperature as constant as possible. The gearmotor must be filled with oil and manually rotated at least once a week to distribute a film of oil over the internal parts and prevent corrosion.

These points were reviewed in a recent issue of Westinghouse Maintenance News by C. W. Miller, chief inspector, Gearing division, Westinghouse Electric Corp. He then gave the following instructions as a basic plan for this equipment.

A foundation or mounting which provides rigidity and prevents "weaving" or "flexing," with resultant misalignment of the shafts, is essential to the successful operation of a gear drive. Use a concrete foundation whenever possible.

Gearmotors are designed with a tolerance of + 0 and — 1/32 in. on the dimension between shaft center and base, therefore shimming may be required. Shims of various thicknesses, slotted to slide around the foundation bolts, should be used. After alignment has been secured through shimming, the gearmotor can be bolted down and grouted in.

When the unit must be installed on structural foundations, a supporting base plate of steel, with a thickness not less than the diameter of the holding-down bolts, should be provided to obtain proper rigidity.

Securing Alignment

If the gearmotor is connected to driven equipment by a coupling, correct alignment cannot be overemphasized. Alignment becomes of greater importance as speeds are increased or the drive is subjected to variations in load conditions. Mis-

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alignment, either parallel or angular, is one of the most frequent causes of bearing or shaft failures. The resultant extra load causes noisy operation or excessive operating temperatures.

Misalignment not exceeding 0.002 in. will not affect operation of the gearmotor. Check alignment by the well-known methods employing straight edges and feeler gauges or dual indicators.

Gearmotors are intended, unless otherwise specified, to be mounted on level foundations. Applications requiring the use of units on angle mountings are always special and will require changes in the lubrication system. Contact manufacturer for detailed data before proceeding.

All motor leads are located in the conduit box on the side of the motor. Leads are tagged and identified to correspond with the wiring diagram engraved on the nameplate of each unit. All electrical connections should be installed in accordance with the National Electric Code and local requirements.

Common Causes of Trouble

If the gearmotor is driving the connected equipment through a sprocket, belt pulley or a pinion mounted on the output shaft of the gearmotor, the center of the face of such overhung member should be located at the center of the shaft extension of the gearmotor. For example, a pulley with a hub which allows the center of the face of the pulley to extend beyond the end of the output shaft of the gearmotor will create an excessive overhung load on the gearmotor's bearings if the unit is loaded to capacity.

If the gearmotor is connected to the driven equipment by a sprocket or chain drive, then the centerline of the two sprockets or pulleys should never be in the vertical plane but always in the horizontal plane. When driving in a vertical plane, the chain stretch permits the chain to slip over the teeth of the lower member. This will result in serious shock loads and may cause premature failure of both the gearmotor and the driven equipment.

When a pinion is mounted on the output shaft of the gearmotor for gear drive or connection to the driven equipment, the area of contact on the pinion teeth must be well distributed over the entire face width of the pinion and uniform from the outside to the inside of the pinion faces. The mesh of the pinion teeth with the mating gear teeth should be adjusted to permit lubrication without taking up the full amount of backlash.

Reflected Loads

The loads imposed upon a gearmotor when driving the driven equipment through such a connection are reflected back into the gearmotor. These loads are, of course, relative to the amount of load required to drive the driven equipment plus any abnormal load created by the grade of gearing or the accuracy of the pinion and gear.

It is important, when checking apparent noisy operation of a gearmotor, to investigate thoroughly the method of transmitting the load from the gearmotor to the driven equipment as well as the accuracy of the parts used.

Normal Operation

During normal operation, when the driving loads are within the designed capacity of the gearmotor, the temperature of the unit should never exceed 160° F. If it is, special operating instructions should be obtained from the manufacturer. When the operating temperature is greater than 160° F. in ambient temperatures no greater than 140° F., some abnormal operating condition exists, and the gearmotor should be immediately checked for oil level and grade of lubricant. Amount of normal load should also be checked as well as the peak loads and the cycle of peak loads that are being transmitted by the unit or reflected in the unit by the driven equipment.—Power Engineering.

—BREAD IS THE STAFF OF LIFE—

CONVERSION CHART FOR TAG MOISTURE METERS

NEW YORK—A revised conversion chart is now available for use with the TAG-Heppenstall moisture meter for grain in determining moisture content of all soft red winter wheat and white wheat grown in eastern areas. It is free of charge to all users of the instrument.

Copies may be obtained by requesting TAG Chart 409 from the manufacturer of the instrument, the Tagliabue Instruments Division, Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.

The result of U.S. Department of Agriculture Studies and comparisons of tests made by the official air oven method with reading obtained from the TAG meter during the past four years, the revised chart incorporates changes deemed necessary and desirable for the soft red winter wheat now being grown. The same chart is applicable to eastern-grown white wheat. Showing slightly higher moisture results at the 14% level and above, the revised chart is now being used by licensed grain inspectors and grain inspection supervisors.

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SPROUT-WALDRON PLANS PLANT MODERNIZATION

MUNCY, PA. — Sprout, Waldron & Co., Inc., has announced the employment of Ben F. Sweet to take charge of its program of expansion and modernization of its gray iron and white iron foundries. Mr. Sweet has been foundry superintendent of Morse Chain Co., Ithaca, N.Y. He assumed his new duties with the Sprout-Waldron organization Aug. 1.

With the completion of its new sheet metal fabrication plant, Sprout-Waldron expects to see completed its modernization program of its fabricating and machining departments on which it embarked approximately three years ago, and which has cost approximately $1 million.

The completion of this program makes possible the starting of a similar program involving the company's diversified and extensive foundry operations.

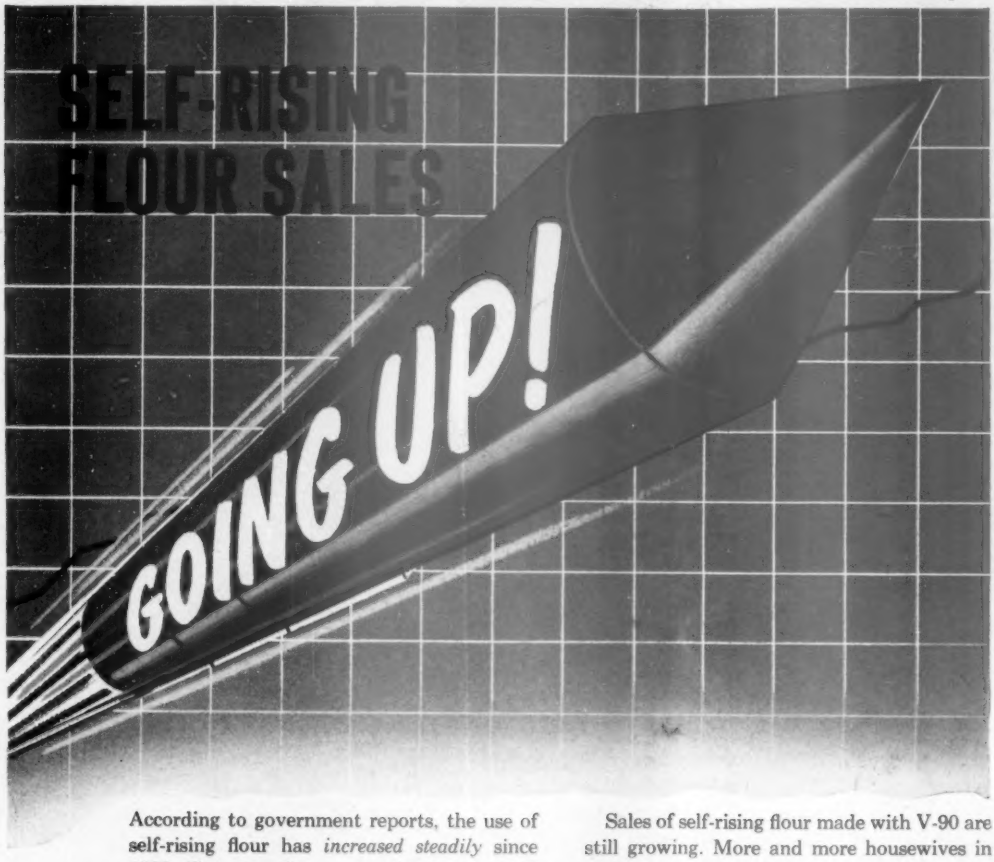
—BREAD IS THE STAFF OF LIFE—

Ordering Repairs

When ordering machinery repair parts by mail, it is an excellent plan always to supply the manufacturer with a rough sketch of the part if the number of the part and the model of the machine are not available.

This is particularly true if the machine is old and there is any chance of the manufacturer misunderstanding the order. Thus, if it is a broken gear, it is not sufficient to tell the machinery maker that "the cast iron gear on the back of the machine" is broken.

Anyone can make a rough sketch that is understandable enough and supplement the sketch with an explanation such as: "The 45-tooth pinion gear that drives a half inch shaft which, in turn, drives the eccentric. The gear is slotted for a three-sixteenth by one-inch key."



According to government reports, the use of self-rising flour has *increased steadily* since 1939. For example . . . production in 1947 (last government figures) was 1,711,000 cwts. *higher* than in 1939.

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Sales of self-rising flour made with V-90 are still growing. More and more housewives in plain flour territory are accepting the greater convenience of self-rising flour and there are *still more* untapped markets that eventually will be predominantly self-rising. Yes . . . there's a great opportunity for millers who make self-rising flour with V-90. That's because V-90 makes any flour keep longer on the shelf, bake better in the kitchen, and the oven products taste better from first bite to last. Make sure your self-rising flour contains V-90 . . . the *ideal* leavening with the *long* life!

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